

CLAIMS

1. An emergency stop system for an elevator, characterized by comprising:

a detection portion for detecting a speed and a position of a car;

a control portion having a storage portion that stores, in correspondence with the position of the car, an overspeed setting level set to be a value larger than the speed of the car during normal operation, the control portion outputting an activation signal when the speed of the car becomes higher than the overspeed setting level at the position of the car obtained based on information from the detection portion;

a governor rope that moves in synchronism with raising and lowering of the car;

a rope catching device having an electromagnetic actuator that is activated upon input of the activation signal, and a restraining portion that restrains the governor rope upon activation of the electromagnetic actuator; and

a braking portion mounted in the car and having a braking member capable of coming into and out of contact with a guide rail for guiding the car, the braking portion braking the car by pressing the braking member against the guide rail when the governor rope is restrained and the car is displaced with respect to the governor

rope.

2. An emergency stop system for an elevator according to Claim 1, characterized in that:

a hoistway in which the car is raised and lowered is provided with an acceleration/deceleration zone in which the car is accelerated/decelerated during normal operation and which adjoins a service floor for the car; and

the overspeed setting level in the acceleration/deceleration zone is set to become progressively smaller toward the service floor.

3. An emergency stop system for an elevator according to Claim 2, characterized in that a reference position detecting portion is provided in the acceleration/deceleration zone, for detecting a position that serves as a reference for detecting the position of the car by the detection portion.

4. An emergency stop system for an elevator according to any one of Claims 1 through 3, characterized in that the detection portion is provided to a governor sheave around which the governor rope is wound.

5. An emergency stop system for an elevator according to any one of Claims 1 through 4, characterized in that the electromagnetic

actuator has: a movable portion displaceable between an activation position where the restraining portion restrains the governor rope and a release position for releasing the restraining of the governor rope; an activation coil for displacing the movable portion into the activation position upon energization of the activation coil; a release coil for displacing the movable portion into the release position upon energization of the release coil; and a permanent magnet for selectively retaining the movable portion in the activation position and the release position.

6. An emergency stop system for an elevator according to any one of Claims 1 through 4, characterized in that the electromagnetic actuator has: a movable portion displaceable between an activation position where the restraining portion restrains the governor rope and a release position for releasing the restraining of the governor rope; an urging portion that urges the movable portion into the activation portion; and an electromagnet for displacing the movable portion into the release position against an urging of the urging portion.

7. An emergency stop system for an elevator according to any one of Claims 1 through 6, characterized in that:

the restraining portion is a pressing member capable of displacement into and out of contact with the governor sheave;

the pressing member is pressed against the governor sheave through the governor rope upon activation of the electromagnetic actuator.

8. An emergency stop system for an elevator according to Claim 7, characterized in that:

the rope catching device further has a ratchet gear rotated integrally with the governor sheave, and a latch operating in an interlocking relation with the pressing member and capable of coming into engagement with the ratchet gear upon activation of the electromagnetic actuator; and

when the latch is engaged with the ratchet gear, the pressing member is displaced due to a rotation force of the ratchet gear to be pressed against the governor sheave through the governor rope.

9. An emergency stop system for an elevator according to any one of Claims 1 through 6, characterized in that:

the restraining portion has a receiving portion formed of a high friction material, and a pressing member displaceable into and out of contact with the receiving portion; and

the pressing member is pressed against the receiving portion through the governor rope upon activation of the electromagnetic actuator.

10. An emergency stop system for an elevator according to Claim 9, characterized in that:

an elastic expansion member is connected to the pressing member; and

as the pressing member is pulled by the governor rope while in contact with the governor rope, the pressing member is displaced so that its pressing force against the receiving portion is increased by the elastic expansion member.